

## **APPENDIX A: JOINT CLAIM CONSTRUCTION CHART**

Pursuant to P.R.4-5(d), Plaintiff TQ Delta, LLC and Defendants CommScope Holding Company, Inc., CommScope Inc., ARRIS US Holdings, Inc., ARRIS Solutions, Inc., ARRIS Technology, Inc., and ARRIS Enterprises, LLC (the “CommScope Defendants”) and Defendants Nokia of America Corp., Nokia Corp. and Nokia Solutions and Networks Oy (the “Nokia Defendants”) hereby provide a Joint Claim Construction Chart containing the disputed claim terms and phrases for the disputed claims for US Patent No. 7,570,686 (“the ‘686 Patent”); US Patent No. 7,453,881 (“the ‘881 Patent”); US Patent No. 8,276,048 (“the ‘048 Patent”); US Patent No. 7,844,882 (“the ‘882 Patent”); US Patent No. 8,090,008 (“the ‘008 Patent”); US Patent No. 8,462,835 (“the ‘835 Patent”); US Patent No. 10,567,112 (“the ‘112 Patent”); US Patent No. 8,468,411 (“the ‘411 Patent”); US Patent No. 9,094,348 (“the ‘348 Patent”); US Patent No. 10,833,809 (“the ‘809 Patent”); US Patent No. 9,485,055 (“the ‘055 Patent”); US Patent No. 9,154,354 (“the ‘354 Patent”); US Patent No. 8,937,988 (“the ‘988 Patent”); US Patent No. 9,014,193 (“the ‘193 Patent”); US Patent No. 9,300,601 (“the ‘601 Patent”); US Patent No. 9,894,014 (“the ‘014 Patent”); US Patent No. 8,495,473 (“the ‘5473 Patent”); US Patent No. 9,547,608 (“the ‘608 Patent”); US Patent No. 10,409,510 (“the ‘510 Patent”); US Patent No. 8,594,162 (“the ‘162 Patent”); US Patent No. 8,595,577 (“the ‘577 Patent”); US Patent No. 10,044,473 (“the ‘4473 Patent”). The second column refers to the term numbers in the Joint Claim Construction Chart and Prehearing Statement (Dkt. 107, Exhibits A-B); TQ Delta, LLC’s Preliminary Election of Asserted Claim sand the term numbers that the parties used in their claim construction briefs. In addition, the parties hereby identify the claim number(s) where the disputed terms and phrases appear.

| Claim Term/Phrase  | Term No. | TQ Delta, LLC's Proposed Construction  | Defendants' Proposed Construction  | Court's Construction |
|--|----------|--|--|----------------------|
| <p>“transceiver”</p> <p><u>Family 1</u><br/>’686 Patent, claims 17, 36, and 37</p> <p><u>Family 2</u><br/>’881 Patent, claims 17, 18, and 23<br/>’193 Patent, claims 1 and 9<br/>’601 Patent, claims 8 and 15<br/>’014 Patent, claims 1 and 3</p> <p><u>Family 3</u><br/>’882 Patent, claims 9 and 13<br/>’048 Patent, claims 1 and 5<br/>’5473 Patent, claims 10 and 28<br/>’608 Patent, claim 2<br/>’510 Patent, claim 22</p> <p><u>Family 6</u><br/>’835 Patent, claim 8<br/>’112 Patent, claims 8 and 10</p> <p><u>Family 9</u><br/>’411 Patent, claim 10 and 18<br/>’577 Patent, claim 16<br/>’348 Patent, claims 1 and 9<br/>’055 Patent, claims 11 and 17<br/>’809 Patent, claims 4, 6, 8, 11, and 13</p> | 1        | <p>Plain and ordinary meaning, which is: “communications device capable of transmitting and receiving data wherein the transmitter portion and receiver portion share at least some common circuitry.”</p> | <p>Plain and ordinary meaning, which is “communications device capable of transmitting and receiving data”</p> |                      |

| Claim Term/Phrase  | Term No. | TQ Delta, LLC's Proposed Construction  | Defendants' Proposed Construction               | Court's Construction |
|--|----------|--|---|----------------------|
| <p>“configured to” / “operable” / “operable to”</p> <p><u>Family 2</u><br/>           ’193 Patent, claims 1 and 9<br/>           ’601 Patent, claim 8<br/>           ’014 Patent, claim 1</p> <p><u>Family 3</u><br/>           ’608 Patent, claim 1<br/>           ’510 Patent, claim 22</p> <p><u>Family 6</u><br/>           ’112 Patent, claim 8</p> <p><u>Family 9</u><br/>           ’577 Patent, claim 16<br/>           ’348 Patent, claims 1 and 9<br/>           ’055 Patent, claim 11</p> <p><u>Family 10</u><br/>           ’354 Patent, claim 10<br/>           ’988 Patent, claim 16</p> | 2        | Plain and ordinary meaning, which is: “able to be configured” / “capable” / “capable to”                             | Plain and ordinary meaning, not mere capability |                      |
| <p>“each bit in the diagnostic message is mapped to at least one DMT symbol”</p> <p><u>Family 1</u><br/>           ’686 Patent, claim 17</p>   | 3        | “each bit in the diagnostic message is communicated using a modulation scheme where a DMT symbol (or two or more DMT | Indefinite.                                     |                      |

| Claim Term/Phrase   | Term No. | TQ Delta, LLC's Proposed Construction  | Defendants' Proposed Construction   | Court's Construction |
|---|----------|--|---|----------------------|
| <p>“DMT symbols that are mapped to one bit of the diagnostic message”</p> <p><u>Family 1</u><br/>'686 Patent, claim 36</p>                    |          | symbols) represents only a single bit of the diagnostic message”   |   |                      |
| <p>“array representing frequency domain received idle channel noise information”</p> <p><u>Family 1</u><br/>'686 Patent, claims 17 and 36</p> | 4        | “ordered set of values representative of noise in the frequency domain that was received by a transceiver on respective subchannels in the absence of a transmission signal on the received channel”                                 | “array of values representative of noise in the frequency domain that was received by a transceiver on respective subchannels in the absence of a transmission signal”  |                      |
| <p>“plurality of bonded transceivers”</p> <p><u>Family 2</u><br/>'881 Patent, claim 17</p>  | 5        | “two or more transceivers located on the same side of two or more physical links where each transceiver is configurable to transmit or receive a different portion of the same bit stream via a different one of the physical links” | “two or more transceivers, located on the same side of two or more physical links and each corresponding to one of the physical links, coordinated to transmit or receive a different portion of the same bit stream via a different one of the physical links” |                      |
| <p>“reduce a difference in latency between the bonded transceivers”</p> <p><u>Family 2</u></p>  | 6        | “reduce a difference in configuration latency”   | Indefinite, or, if not indefinite, “minimize the difference in the configuration latencies  |                      |

| Claim Term/Phrase   | Term No. | TQ Delta, LLC's Proposed Construction  | Defendants' Proposed Construction   | Court's Construction |
|---|----------|--|---|----------------------|
| '881 Patent, claim 17   |          |  | between the bonded transceivers"  |                      |
| "each bonded transceiver utilizing at least one transmission parameter value to reduce a difference in latency between the bonded transceivers" | 7        | "reduce a difference in configuration latency"   | Indefinite, or, if not indefinite, "minimize the difference in the configuration latencies between the bonded transceivers" |                      |
| <u>Family 2</u><br>'881 Patent, claim 17  |          |  |   |                      |
| "shared memory" / "sharing the memory" / "operable to be shared" / "sharing"  |          | "common memory used by at least two functions, where a portion of the memory can be used by either one of the functions" | Plain and ordinary meaning  |                      |
| <u>Family 3</u><br>'882 Patent, claims 9 and 13 ("shared memory")   | 8        |  |   |                      |
| '048 Patent, claims 1 and 5 ("shared memory")   |          |  |   |                      |
| '5473 Patent, claim 10 ("sharing the memory")   |          |  |   |                      |
| '608 Patent, claim 2 ("operable to be shared / sharing")  |          |  |   |                      |
| '510 Patent, claim 21 ("shared memory")   |          |  |   |                      |

| Claim Term/Phrase   | Term No. | TQ Delta, LLC's Proposed Construction                                      | Defendants' Proposed Construction   | Court's Construction |
|---|----------|--|---|----------------------|
| <p>“wherein the generated message indicates how the memory has been allocated between the [first deinterleaving / interleaving] function and the [second] deinterleaving function” / “a message indicating how the shared memory is to be used by the interleaver or the deinterleaver”</p> <p><u>Family 3</u><br/>’5473 Patent, claims 10 and 28</p> | 9        | Plain and ordinary meaning. No construction necessary.                     | Plain and ordinary meaning, i.e., “the message indicates the amount of memory [that has been allocated to / is to be used by] the [first deinterleaving / interleaving] function and the amount of memory [that has been allocated to / is to be used by] the [second] deinterleaving function” |                      |
| <p>“specifying a maximum number of bytes of memory that are available to be allocated to [a/an interleaver/deinterleaver]”</p> <p><u>Family 3</u><br/>’882 Patent, claims 9 and 13<br/>’048 Patent, claim 1 and 5</p>   | 10       | Plain and ordinary meaning. No construction necessary.                     | Plain and ordinary meaning.   |                      |
| <p>“phase characteristic(s)” / “each carrier signal has a phase characteristic associated with the bit stream”</p> <p><u>Family 4</u><br/>’008 Patent, claim 14</p>   | 11       | “one or more values that represent the angular aspect of a carrier signal” | Plain and ordinary meaning  |                      |

| Claim Term/Phrase   | Term No. | TQ Delta, LLC's Proposed Construction   | Defendants' Proposed Construction | Court's Construction |
|---|----------|---|-----------------------------------|----------------------|
| <p>“substantially scramble the phase characteristics of the plurality of carrier signal”</p> <p><u>Family 4</u><br/>'008 Patent, claim 14</p>   | 12       | “adjust the phase characteristics of the carrier signals by varying amounts to produce a transmission signal with a reduced peak to-average power ratio (PAR)”  | Plain and ordinary meaning        |                      |
| <p>“same bit value”</p> <p><u>Family 4</u><br/>'008 Patent, claim 14</p>  | 13       | “value of the same bit”   | Indefinite.                       |                      |
| <p>“multiple carrier signals corresponding to the scrambled carrier signals are used by the first multicarrier transceiver to modulate the same bit value”</p> <p><u>Family 4</u><br/>'008 Patent, claim 14</p> | 14       | “a first carrier signal is used by the first multicarrier transceiver to demodulate the value of a bit of the received bit stream and at least one more carrier signal is used by the first multicarrier transceiver to demodulate the value of the same bit of the received bit stream, wherein the carrier signals correspond to the plurality of phase-shifted and scrambled carrier signals.” | Indefinite.                       |                      |

| <b>Claim Term/Phrase</b>   | <b>Term No.</b> | <b>TQ Delta, LLC's Proposed Construction</b>           | <b>Defendants' Proposed Construction</b>   | <b>Court's Construction</b> |
|--|-----------------|--|--|-----------------------------|
| <p>“computing a phase shift for each carrier signal”</p> <p><u>Family 4</u><br/>’008 Patent, claim 14</p>  | 15              | Plain and ordinary meaning. No construction necessary. | “computing the amount by which a phase is adjusted for each carrier signal”  |                             |
| <p>“combining the phase shift computed for each respective carrier signal with the phase characteristic of that carrier signal”</p> <p><u>Family 4</u><br/>’008 Patent, claim 14</p> | 16              | Plain and ordinary meaning. No construction necessary. | “adjusting the phase of each carrier signal by an amount computed for that carrier signal”   |                             |
| <p>“steady-state communication”</p> <p><u>Family 6</u><br/>’835 Patent, claim 8<br/>’112 Patent, claim 8</p>   | 17              | “Showtime”   | “the state of the transceiver reached after all initialization and training is completed in which user data is transmitted or received”  |                             |
| <p>“FIP setting”</p> <p><u>Family 6</u><br/>’835 Patent, claims 8, 10, and 26<br/>’112 Patent, claim 8</p>   | 18              | Plain and ordinary meaning. No construction necessary. | “forward error correction and interleaver parameters characterized by the set of parameters for codeword size in bytes, number of information bytes in a codeword, number of parity or redundancy bytes in a codeword, and interleaver depth in number of codewords” |                             |

| Claim Term/Phrase  | Term No. | TQ Delta, LLC's Proposed Construction   | Defendants' Proposed Construction   | Court's Construction |
|--|----------|---|---|----------------------|
| <p>“FIP value”</p> <p><u>Family 6</u><br/>‘835 Patent, claim 8</p>   | 19       | Plain and ordinary meaning. No construction necessary.  | “numerical value of codeword size in bytes, number of information bytes in a codeword, number of parity or redundancy bytes in a codeword, or interleaver depth in number of codewords” |                      |
| <p>“flag signal”</p> <p><u>Family 6</u><br/>‘835 Patent, claim 8<br/>‘162 Patent, claims 8 and 9</p>                   | 20       | “signal used to indicate when an updated FIP setting / interleaver parameter value is to be used (the signal does not contain message data indicating when the updated FIP setting/ interleaver parameter value is to be used)” | “signal used to indicate when updated FIP settings / interleaver parameter values are to be used”   |                      |
| <p>“interleaver parameter value”</p> <p><u>Family 6</u><br/>‘835 Patent, claims 10 and 26<br/>‘162 Patent, claim 8</p> | 21       | Plain and ordinary meaning. No construction necessary.  | “the numerical value of the interleaver depth in number of codewords”   |                      |
| <p>“higher immunity to noise”</p> <p><u>Family 9</u><br/>‘348 Patent, claim 2</p>                                      | 22       | “higher SNR margin”   | plain and ordinary meaning  |                      |

| <b>Claim Term/Phrase</b>  | <b>Term No.</b> | <b>TQ Delta, LLC's Proposed Construction</b>           | <b>Defendants' Proposed Construction</b> | <b>Court's Construction</b> |
|---|-----------------|--|--|-----------------------------|
| <p>“receive at least one packet using deinterleaving, and transmit at least one message without using interleaving”</p> <p><u>Family 9</u><br/>’577 Patent, claim 16</p>  | 23              | Plain and ordinary meaning. No construction necessary. | Indefinite.                              |                             |
| <p>“[transmit/receive] a [packet/plurality of messages] using a forward error correction [encoder/decoder] and [without using] [an/a interleaver/deinterleaver]”</p> <p><u>Family 9</u><br/>’348 Patent, claims 1 and 9</p> | 24              | Plain and ordinary meaning. No construction necessary. | Indefinite.                              |                             |
| <p>“[transmitting/transmit/receiving/receive] a [packet/message] using forward error correction [encoding/decoding] and [without using] [interleaving/deinterleaving]”</p> <p><u>Family 9</u><br/>’809 Patent, claim 8</p>  | 25              | Plain and ordinary meaning. No construction necessary. | Indefinite.                              |                             |
| <p>“A multicarrier communications transceiver operable to: receive a multicarrier symbol comprising a first plurality of carriers”</p>  | 26              | Plain and ordinary meaning. No construction necessary. | Indefinite.                              |                             |

| Claim Term/Phrase  | Term No. | TQ Delta, LLC's Proposed Construction                  | Defendants' Proposed Construction  | Court's Construction |
|--|----------|--|--|----------------------|
| <u>Family 10</u><br>'354 Patent, claim 10  |          |  |  |                      |
| “receive a first plurality of bits on the first plurality of carriers using a first SNR margin;<br>receive a second plurality of bits on the second plurality of carriers using a second SNR margin” | 27       | Plain and ordinary meaning. No construction necessary. | Indefinite.  |                      |
| <u>Family 10</u><br>'354 Patent, claim 10  |          |  |  |                      |
| “wherein the first SNR margin provides more robust reception than the second SNR margin”   | 28       | Plain and ordinary meaning. No construction necessary. | Indefinite.  |                      |
| <u>Family 10</u><br>'354 Patent, claim 10  |          |  |  |                      |
| “signal to noise ratio (SNR) margin” / “SNR margin”  | 29       | Plain and ordinary meaning. No construction necessary. | a parameter used in determining the number of bits allocated to each of a plurality of carriers, where the value of the parameter specifies an extra SNR requirement assigned per carrier in addition to the SNR required to maintain a specified bit error rate (BER) for the |                      |
| <u>Family 10</u><br>'988 Patent, claim 16<br>'354 Patent, claims 10  |          |  |  |                      |

| <b>Claim Term/Phrase</b> | <b>Term No.</b> | <b>TQ Delta, LLC's Proposed Construction</b> | <b>Defendants' Proposed Construction</b>         | <b>Court's Construction</b> |
|--------------------------|-----------------|--|--|-----------------------------|
|                          |                 |  | communication link at a specified bit allocation |                             |